

WHAT IS CLAIMED IS:

1. A digital broadcast reception apparatus for receiving a digital broadcast containing image information for an input operation, wherein the image information accepts the input operation of a user, provides broadcast information reflecting the input operation result, and is prepared to presume that the user operates a key of a remote control having a predetermined function, the digital broadcast reception apparatus comprising:

a touch panel for enabling the user to touch a surface of the touch panel for performing the input operation;

a display unit for displaying the image information for the input operation;

an analysis unit for analyzing an operation concerning the remote control contained in the image information for the input operation and pseudo-assigning a function of the input operation to the remote control to a touch operation area of the touch panel on the basis of the analysis result; and

a control unit being responsive to the touch operation to the touch panel, the control unit for making a response corresponding to the pseudo input operation to the remote control in response to the touched area of the touch panel according to the assignment of the analysis unit.

2. The digital broadcast reception apparatus according to claim 1, wherein:

the digital broadcast contains the image information for  
5 the input operation as a content described in a predetermined document description language for broadcast;

the content is associated with an event caused by the input operation to the remote control;

the touch panel is placed on a surface of a screen on  
10 which the display unit displays the image information for the input operation;

the analysis unit displays an operation guide on the display unit corresponding to the area assignment; and

when the user touches an area of the touch panel  
15 corresponding to the operation guide display, the control unit causes an event, which is caused by the input operation to the remote control assigned to the area of the touch panel corresponding to the operation guide display.

20 3. The digital broadcast reception apparatus according to claim 1, wherein:

when input operation functions of the remote control contains an input operation function, which is assigned to no area by the analysis of the operation concerning the remote  
25 control, the analysis unit assigns a touch operation area of

the touch panel for a software remote control function to the input operation function, which is assigned to no area by the analysis of the operation concerning the remote control; and

the analysis unit displays an operation guide of the software remote control function on the display unit corresponding to the touch operation area for the software remote control function area.

4. The digital broadcast reception apparatus according to claim 3, wherein:

the analysis unit assigns the touch operation area for the software remote control function to the touch panel so as not to overlap the area assigned by analyzing the operation.

5. The digital broadcast reception apparatus according to claim 4, wherein:

if an appropriate area assigned to the software remote control function does not exist in the touch panel, the analysis unit moves an assigned area every given time.

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6. The digital broadcast reception apparatus according to claim 3, wherein

when the user does not perform an input operation to the software remote control function within a predetermined time, the analysis unit stops the assignment to the software remote

control function and stops the operation guide display for the software remote control function.

7. The digital broadcast reception apparatus  
5 according to claim 3, wherein:

the analysis unit assigns an area for starting the software remote control function to an area of the touch panel where the display unit does not display the image information for the input operation; and

10 when the control unit detects a touch operation to the area for starting the software remote control function, the software remote control function is started.

8. The digital broadcast reception apparatus  
15 according to claim 3, further comprising:

a voice recognition unit for recognizing voice input, wherein:

the analysis unit starts the software remote control function when the voice recognition unit recognizes a  
20 predetermined instruction.

9. The digital broadcast reception apparatus according to claim 3, wherein:

the analysis unit switches the assignment to the operation  
25 guide display on the display unit corresponding to the touch

panel area assigned for the software remote control function between effectiveness and ineffectiveness at preset time intervals.

5           10. The digital broadcast reception apparatus according to claim 2, wherein:

the analysis unit displays on the display unit a cursor and an event element, which is associated with a predetermined event and can be specified based on a position of the cursor;

10           the analysis unit associates a movement of a touch position of the touch panel detected by the control unit with an event for the remote control to move the cursor; and

the analysis unit associates an operation of stopping touch of the touch panel and breaking away from the touch panel  
15 detected by the control unit with an event for the remote control to determine the event element at the cursor position.

11. The digital broadcast reception apparatus according to claim 10, wherein:

20           the control unit determines as to whether or not the event element exists in the image information for the input operation on the display unit corresponding to a position where the user stops touch of the touch panel and breaks away from the touch panel; and

25           when the control unit determines that the event element

does not exist, the control unit does not interpret user's operation as the determination operation.

12. The digital broadcast reception apparatus  
5 according to claim 2, wherein:

the analysis unit displays an event element on the display unit in a display mode so that the event element is distinguished from other images.

10 13. The digital broadcast reception apparatus according to claim 1, wherein:

the analysis unit determines as to whether or not assignment of touch areas of the touch panel based on the analysis result is crowded in accordance with a predetermined criterion;

15 when the analysis unit determines that the assignment of the touch areas is crowded, the analysis unit performs a re-assignment with enlarging the vicinity of the touch areas in response to a first touch detection of the control unit; and

20 the control unit makes the response in response to a detection result of touch of the re-assigned area by the analysis unit.

14. The digital broadcast reception according to claim  
25 13, wherein:

when the control unit does not detect the touch operation of the touch panel within a predetermined time range after the re-assignment, the analysis unit stops the area re-assignment.

5           15. A digital broadcast reception apparatus for receiving a bi-directional digital broadcast containing image information, the digital broadcast reception apparatus comprising:

          a touch panel;

10           a display unit for displaying the image information;

          a analysis unit for analyzing the image information, assigning input functions to regions on the touch panel on the basis of the analysis result, and displaying the input functions on the assigned regions, respectively; and

15           a control unit, wherein:

          when a user touches at least one of the assigned regions on the touch panel, the control unit executes the input function corresponding to the at least one of the assigned regions.

20           16. The digital broadcast reception apparatus according to claim 15, wherein:

          when the analysis unit does not assigns at least one of the input functions to the regions on the touch panel on the basis of the analysis result, the analysis unit assigns the  
25   at least one of the input functions to an other region on the

touch panel so that the at least one of the input functions is displayed so as not to overlap the other displayed input functions.

5           17.   The digital broadcast reception apparatus according to claim 16, wherein:

          when it is impossible for the analysis unit assigns the at least one of the input functions to the other region on the touch panel so that the at least one of the input functions  
10 is displayed so as not to overlap the other displayed input functions, the analysis unit changes a position to which the at least one of the input functions is assigned at a predetermined interval.

15           18.   The digital broadcast reception apparatus according to claim 16, wherein:

          when the user touches a still other region on the touch panel where the input functions are not displayed, the analysis unit begins the assignment of the at least one of the input  
20 functions.

          19.   The digital broadcast reception apparatus according to claim 15, wherein:

          the analysis unit determines as to whether or not the  
25 regions to which the input functions are assigned are closer



to each other than a predetermined criterion;

when the analysis unit determines that the regions to which the input functions are assigned are closer to each other than a predetermined criterion and the user touches at least one of the close regions, the control unit controls the display unit to perform an enlarged display of the vicinity of the touched at least one of the close regions.

20. The digital broadcast reception apparatus  
10 according to claim 15, wherein:  
the display unit and the touch panel are integrated.

21. A digital broadcast reception method for receiving a bi-directional digital broadcast containing image  
15 information, the digital broadcast reception method comprising:

analyzing the image information;  
assigning input functions to regions on a touch panel on the basis of the analysis result;  
20 displaying the input functions on the assigned regions, respectively; and

when a user touches at least one of the assigned regions on the touch panel, executing the input function corresponding to the at least one of the assigned regions.

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